

**U. S. Department of the Interior
Bureau of Reclamation**

**Mid-Pacific Region
Lahontan Basin Area Office
Carson City, Nevada**

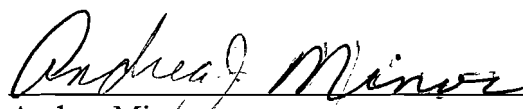
**Finding of No Significant Impact
and
Environmental Assessment**

**Patua Geothermal Project
Churchill County, Nevada**

December 2010

FONSI NO. LO-10-04

Prepared by:



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Date: 12/6/10

Recommended:

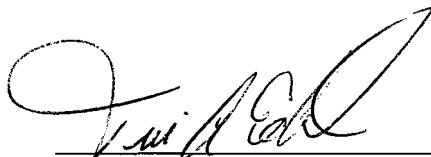


Renee Kolvet
Resource Division Manager

Date: 12/06/2010

Acting
for

Approved:



Terri Edwards
Deputy Area Manager

Date: 12/7/2010

FINDING OF NO SIGNIFICANT IMPACT
Patua Geothermal Project
Geothermal Unit N-85168X
DOI-BLM-NV-CO10-2010-0016-EA

I. Background, Proposed Action, and Purpose and Need

Vulcan Power Company (VPC) has acquired the rights to all federal geothermal leases issued by the Department of the Interior (DOI), Bureau of Land Management (BLM) for the Patua Geothermal Unit N-85168X (Unit). In addition, VPC has agreements with private landowners for the rights to the geothermal resources associated with the majority of the private lands within the Unit. The lease areas are located in Churchill and Lyon Counties, Nevada. The BLM manages the subsurface geothermal resources underlying the federal leases in the project area and the Bureau of Reclamation, Lahontan Basin Area Office (Reclamation) is the surface management agency. This Environmental Assessment (EA) was jointly prepared between BLM and Reclamation, pursuant to the national Reclamation/BLM Interagency Agreement, December 1982.

VPC is proposing to design, construct, and operate geothermal well pads and wells, geothermal fluid pipelines, transmission lines, and their associated access roads. These facilities would be connected to a new 60 MW net geothermal power generation facility, to be located on a privately owned section of land within the Unit. The project area is shown in Figure 1.1-2 (attached). The elements of the proposed action include:

- Reclamation-managed lands
 - Construct approximately 6 miles of access roads to support well pads, pipeline, and transmission line construction and access
 - Construct four to six new well pads and drill one to five wells per pad
 - Construct approximately 3.7 miles of 120 kV transmission line segments
 - Construct approximately 1.1 to 2.2 miles of geothermal fluid pipelines
- State of Nevada-managed lands
 - Construct approximately 2.2 miles of new access roads
 - Construct approximately 2.2 miles of 120 kV transmission line segments
- Private land
 - Construct 6.75 miles of access roads
 - Construct one to three new well pads and drill one to five wells per pad
 - Drill additional wells on six existing pads
 - Construct a 60 MW net power plant
 - Construct approximately 0.5 miles of 120 kV transmission line segment
 - Construct up to approximately 6.75 miles of geothermal fluid pipelines

BLM oversees approval of the geothermal facilities on Reclamation-managed lands in consultation with Reclamation, and both agencies determined through this analysis the terms and conditions under which it will authorize the geothermal facilities. Reclamation's action would be to issue a 20 year license authorizing a ROW for a 120kV transmission line. The ROW on Reclamation land would be approximately 3.5 miles

long and 75 feet wide. This line would connect a new power plant on private land north of Hazen to a new substation in Fernley.

The purpose of the proposed action is to develop a portion of the geothermal resources on the geothermal leases in the southwest area of the Patua Geothermal Unit in order to produce electricity. The need for the project is to meet the requirements of the National Energy Policy Act of 2005 and other federal policies that encourage the use of alternative and renewable energy. The Geothermal Steam Act of 1970, amended and supplemented by the National Energy Policy Act of 2005; the Mining and Mineral Policy Act (MMPA) of 1970; and the National Materials and Mineral Policy, Research and Development Act of 1980 direct the federal government to foster and encourage private enterprise to develop alternative energy resources with appropriate environmental constraints.

II. Summary of Impacts

Proposed Action Alternative:

Vulcan's lease contains stipulations specific to Reclamation lands (Attachment 1 to the FONSI). The EA also includes Environmental Protection Measures that identify emergency plans and specific environmental protection measures, including Best Management Practices (BMPs), listed by activity or environmental resource area (Attachment 2 to the FONSI).

There would be no impact to Threatened and Endangered Species.

The Proposed Action, as mitigated, is compatible with existing and future lands uses, including Newlands Project facilities.

The proposed action has the potential to affect cultural resources if a significant site is damaged or destroyed; however, protection measures included in the project would minimize the likelihood of effects (through avoiding all known resources and stopping work if a resource or remains are encountered). The construction and operations would avoid all known Cultural Resources identified during the survey activities.

BLM initiated consultation with local Tribes on Native American religious concerns upon review and approval of the Operations Plan. BLM's Field Manager held face-to-face meeting with the Tribal representatives. Consultations will continue as the project progresses.

There would be a positive impact to socio-economic resources, due to the influx of workers.

Hazardous materials would be onsite during construction and operations; however, lease stipulations include measures for proper handling and disposal of materials. A hazardous materials spill prevention plan and blowout plan are also included in the Environmental Protection Measures.

There is the potential for an increase in invasive or noxious species due to soil disturbance and the likelihood of unauthorized off highway vehicles using the newly constructed well pad roads for greater access. The potential to increase the spread of invasive, non-native species would be minimized through the implementation of the Noxious Weed Abatement Plan.

There would be potential impacts to livestock, water resources, wetlands, flood plains, vegetation, wildlife, migratory birds, soils, air quality:

Livestock forage would be reduced due to surface disturbance and vegetation removal. This is a minimal impact in terms of overall acreage. Revegetation efforts will help mitigate the loss of forage. There would be residual impacts to livestock due to an increased human presence in the area.

Wildlife would be impacted due to direct loss of habitat and habitat fragmentation. There is the potential for direct mortality during construction and from vehicle collisions. Revegetation efforts will help minimize the loss of habitat. There would be residual disturbance due to an increased human presence in the area.

As mentioned above, there is a potential to impact migratory birds due to loss of habitat and residual disturbance. Loss of nests, eggs, and young would be mitigated due to timing restrictions of construction. Mitigation measures on transmission lines, such as anti-perching and anti-collision devices, would also be employed.

Soils in the area have the potential to be impacted due to vegetative cover being removed. This will be minimized by the use of BMPs during construction and operations.

Air quality is likely to be impacted by fugitive dust, combustion emissions, hydrogen sulfide (H₂S), and greenhouse gases (GHG). Dust will be minimized by the use of BMPs. Combustion emissions and H₂S would also be minimized by use of BMPs in order to meet acceptable state standards. NDEP has exempted geothermal projects from GHG reporting.

Floodplains are not likely to be impacted by this project. The wells and power plants are outside the 100-year floodplain. The transmission line intersects the floodplain, but would either likely span the floodplain or have a minimal footprint. BMPs, including construction during the dry season, will minimize any impacts.

Water resources have the potential to be impacted, both in terms of water quality and hydrology. BMPs would minimize surface impacts. The type of cooling for the proposed project has not yet been determined, but could include geothermal fluid, groundwater, or air cooling. If VPC uses geothermal fluid for cooling, this action would require a permit and review by the State Engineer. If VPC were to use groundwater for cooling, a state permit would be acquired and the State Engineer's rules would require

that existing uses of water are not impacted. Dry cooling would require no additional water consumption and, therefore, would have few to no effects on wetlands.

In accordance with lease stipulations, VPC would prepare and submit a hydrologic baseline data collection plan for approval by the BLM and/or Reclamation, prior to drilling. The plan would be implemented during drilling and project operation.

Construction of the well field and power plant would have no direct effects on wetlands and riparian areas because no wetlands or riparian areas occur in this area. Wetlands have the potential to be impacted indirectly if groundwater withdrawal is used for cooling. Groundwater wells are expected to be located in a deep aquifer that is separate from the shallow aquifer that is likely supporting the wetlands. There would be minimal expected effects to the wetlands supported by shallow groundwater due to the separation of aquifers.

The No Action Alternative: This includes no action of any kind. The environment would remain the same as it currently exists. No geothermal exploration or development of any kind would occur. No ground-disturbing earthwork, drilling, road-building, pad construction, or other activities described in the project description would occur. No impacts to the existing environment would occur as it would remain unchanged.

No other alternatives were assessed because there are no unresolved conflicts involving alternative uses of the resources [BLM NEPA Handbook H 1790-1, page IV-3].

Cumulative impacts / Irreversible and Irretrievable Commitments:

Current land use activities in the vicinity of the project include existing geothermal exploration activities by VPC and grazing. The existing, LADWPs PDCI 500 kV transmission line corridor abuts the western edge of the project area. The Fernley Wildlife Management Area (FWMA) is also managed in the area. Portions of private land are also located around the project area.

Other existing activities in the project area include:

- The Fernley East Wastewater Treatment Facility (FEWWTF), which discharges effluent into the FWMA
- Dispersed recreation
- Off-highway vehicle (OHV) use (currently illegal use)
- Other illegal uses

Reasonably foreseeable future actions constitute those actions that are known or could reasonably be anticipated to occur within the study area, within a time frame appropriate to the expected impacts from the Proposed Action. For the Proposed Action, the time frame for potential future actions is assumed to be the duration of the lease, or approximately 35 years. Future activities are anticipated to include all current land use activities (i.e., grazing, current geothermal energy exploration, recreation, OHV use, and drainage for Newlands Irrigation Project), as well as geothermal development. The

project is located near the Hazen Lease Area (although not a part of these leases). The Hazen leases are located approximately 2 miles to the southwest of the proposed well field. No exploration or development has occurred to date on these leases although exploration and development could occur in the future. Several other leases within the Patua Unit could also be developed in the future. A new transmission line and substation is being constructed by NV Energy and/or a private developer on private land, where VPC will interconnect.

Because reasonably foreseeable future actions are similar to the proposed action, the cumulative impacts are likely to be to the same resources and uses as those potentially impacted by the proposed action. These would include potential impacts to livestock, vegetation, water resources, wildlife, migratory birds, cultural resources, soils, water resources, wetlands, and air quality. There is a greater likelihood of hazmat spills, and an increasing chance of spread of noxious or invasive species. If the other developments employ BMPs and similar mitigating measures, the potential for impacts decreases.

III. Comments Received on the EA

The only comments BLM received were from the Nevada State Clearinghouse. These involved dark sky lighting restrictions and a letter from the Division of Water Resources indicating that the application for water use have not been approved.

IV. Findings

In coordination with Reclamation, BLM prepared an environmental assessment on the impacts of authorizing the various components of Vulcan's Patua Geothermal Project. The EA documents that compliance has occurred with the Endangered Species Act, Section 106 of the National Historic Preservation Act, Indian Trust Assets, Clean Air Act, Clean Water Act, Environmental Justice, Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, and the National Environmental Policy Act.

The Lahontan Basin Area Office has found that the proposed action is not a major federal action that would significantly affect the quality of the human environment. Therefore, an environmental impact statement is not required for carrying out this action.

Following are the reasons why the impacts of the proposed action are not significant:

1. There would be short-term, temporary impacts during construction to the following resources: wildlife, migratory birds, soils, air quality, and vegetation. Many of these impacts will be mitigated by BMPs and other measures.
2. There will be no impact to Threatened or Endangered Species.
3. There are no known impacts to Native American Religious concerns.

4. Implementing the proposed action will not disproportionately affect minorities or low-income populations and communities.

5. Hazardous materials will be handled in accordance with federal and state regulations. An emergency response plan would be implemented that includes contingencies for hazardous materials spills and disposals.

6. Historic or cultural resources: Protection measures included in the project would minimize the likelihood of effects (through avoiding all known resources and stopping work if a resource or remains are encountered).

V. Mitigating Measures / Resource Commitments

BLM is responsible for ensuring that all lease stipulations and Environmental Protection Measures are followed.

My Decision is to concur with the environmental assessment and issue the 20 year license authorizing the ROW to Vulcan Power Company.

Attachment 1

BLM EA CO-10-2010-0016

**LEASE STIPULATIONS
BUREAU OF RECLAMATION**

The Lessee agrees to maintain, if required by the lessor during the period of this lease, including any extension thereof, an additional bond with qualified sureties in such sum as the lessor, if it considers that the bond required under Section 2(a) is insufficient, may at any time require:

(a) to pay for damages sustained by any reclamation homestead entryman to his crops or improvements caused by drilling or other operations of the lessee, such damages to include the reimbursement of the entryman by the lessee, when he uses or occupies the land of any homestead entryman, for all construction and operation and maintenance charges becoming due during such use or occupation upon any portion of the land so used and occupied;

(b) to pay any damage caused to any reclamation project or water supply thereof by the lessee's failure to comply fully with the requirements of this lease; and

(c) to recompense any non-mineral applicant, entryman purchaser under the Act of May 16, 1930 (46 Stat. 367), or patentee for all damages to crops or to tangible improvements caused by drilling or other prospecting operations, where any of the lands covered by this lease are embraced in any nonmineral application, entry, or patent under rights initiated prior to the date of this lease, with a reservation of the oil deposits, to the United States pursuant to the Act of July 17, 1914 (38 Stat. 509).

As to any lands covered by this lease within the area of any Government reclamation project, or in proximity thereto, the lessee shall take such precautions as required by the Secretary to prevent any injury to the lands susceptible to irrigation under such project or to the water supply thereof; *provided* that drilling is prohibited on any constructed works or right-of-way of the Bureau of Reclamation, and *provided, further*, that there is reserved to the lessor, its successors and assigns, the superior and prior right at all times to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures, and reclamation works, in which construction, operation, and maintenance, the lessor, its successors and assigns, shall have the right to use any or all of the lands herein described without making compensation therefore, and shall not be responsible for any damage from the presence of water thereon or on account of ordinary, extraordinary, unexpected, or unprecedented floods. That nothing shall be done under this lease to increase the cost of, or interfere in any manner with, the construction, operation, and maintenance of such works. It is agreed by the lessee that, if the construction of any or all of said dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone or telegraph lines electric transmission lines, roadways, appurtenant irrigation structures or reclamation works across, over, or upon said lands should be made more expensive by reason of the existence of the improvements and workings of the lessee thereon, said additional expense is to be estimated by the Secretary of the Interior, whose estimate is to be final and binding upon the parties hereto, and that within thirty (30) days after demand is made upon the lessee for payment of any such sums, the lessee will make payment thereof to the United States, or its successors, constructing such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures, or reclamation works, across, over, or upon said lands; *provided, however*, that subject to advance written approval by the United States the location and course of any improvements or works and appurtenances may be changed by the lessee; *provided further*, that the reservations, agreements, and conditions contained in the within lease shall be and remain applicable notwithstanding any change in the location or course of said improvements or works of lessee. The lessee further agrees, that the United States, its officers, agents, and employees, and its successors and assigns shall not be held liable for any damage to the improvements or workings of the lessee resulting from the construction, operation, and maintenance of any of the works herein above enumerated. Nothing in this paragraph shall be construed as in any manner limiting other reservations in favor of the United States contained in this lease.

THE LESSEE FURTHER AGREES That there is reserved to the lessor, its successors and assigns, the prior right to use any of the lands herein leased, to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures, and also the right to remove construction materials therefrom, without any payment made by the lessor or its successors for such right, with the agreement on the part of the lessee that if the construction of any or all of such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures across, over, or upon said lands or the removal of construction materials therefrom, should be made more expensive by reason of the existence of improvements or workings of the

lessee thereon, such additional expense is to be estimated by the Secretary of the Interior, whose estimate is to be final and binding upon the parties hereto, and that within thirty (30) days after demand is made upon the lessee for payment of any such sums, the lessee will make payment thereof to the United States or its successors constructing such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures across, over, or upon said lands or removing construction materials therefrom. The lessee further agrees that the lessor, its officers, agents, and employees and its successors and assigns shall not be held liable for any damage to the improvements or workings of the lessee resulting from the construction, operation, and maintenance of any of the works herein above enumerated. Nothing contained in this paragraph shall be construed as in any manner limiting other reservations in favor of the lessor contained in this lease.

SPECIAL STIPULATION - BUREAU OF RECLAMATION

To assist in preventing damage to any Bureau of Reclamation dams, reservoirs, canals, ditches, laterals, tunnels, and related facilities, and contamination of the water supply therein, and to avoid interference with recreation development and/or impacts to fish and wildlife habitat, the lessee agrees that the following conditions shall apply to all exploration and developmental activities and other operation of the works thereafter on lands covered by this lease:

1. Prior to commencement of any surface-disturbing work including drilling, access road work, and well location construction, a surface use and operations plan will be filed with the appropriate officials. A copy of this plan will be furnished to the Resource Division Manager, Lahontan Basin Area Office, Bureau of Reclamation, 705 North Plaza Street, Room 320, Carson City, Nevada 89701, for review and consent prior to approval of the plan. Such approval will be conditioned on reasonable requirements needed to prevent soil erosion, water pollution, and unnecessary damages to the surface vegetation and other resources, including cultural resources, of the United States, its lessees, permittees, or licensees, and to provide for the restoration of the land surface and vegetation. The plan shall contain provisions as the Bureau of Reclamation may deem necessary to maintain proper management of the water, recreation, lands, structures, and resources, including cultural resources, within the prospecting drilling, or construction area.

Drilling sites for all wells and associated investigations such as seismograph work shall be included in the above-mentioned surface use and operation plan.

If later explorations require departure from or additions to the approved plan, these revisions or amendments, together with a justification statement for proposed revisions, will be submitted for approval to the Resource Division Manager, Lahontan Basin Area Office, Bureau of Reclamation, or their authorized representative.

Any operations conducted in advance of approval of an original, revised, or amended prospecting plan, or which are not in accordance with an approved plan constitute a violation of the terms of this lease. The Bureau of Reclamation reserves the right to close down operations until such corrective action, as is deemed necessary, is taken by the lessee.

2. No occupancy of the surface of the following areas is authorized by this lease. It is understood and agreed that the use of these areas for Bureau of Reclamation purposes is superior to any other use. The following restrictions apply only to mineral tracts located within the boundary of a Bureau of Reclamation project where the United States owns 100 percent of the fee mineral interest.

- a. Within 500 feet on either side of the centerline of any and all roads or highways within the leased area.
- b. Within 200 feet on either side of the centerline of any and all trails within the leased area.
- c. Within 500 feet of the normal high-water line of any and all live streams in the leased area.
- d. Within 400 feet of any and all recreation developments within the leased area.

- e. Within 400 feet of any improvements either owned, permitted, leased, or otherwise authorized by the Bureau of Reclamation within the leased area.
- f. Within 200 feet of established crop fields, food plots, and tree/shrub plantings within the leased area.
- g. Within 200 feet of slopes steeper than a 2:1 gradient within the leased area.
- h. Within established rights-of-way of canals, laterals, and drainage ditches within the leased area.
- i. Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area.
- j. Providing that appropriate environmental compliance measures can be ensured, and providing further that Reclamation project works and other public interests can be protected, Reclamation may consider, on a case-by-case basis, waiving the requirement specified in Section 2 hereof. **HOWEVER, LESSEES ARE ADVISED THAT OBTAINING SUCH A WAIVER CAN BE A DIFFICULT, TIME CONSUMING, AND COSTLY PROCESS WITH NO GUARANTEE THAT RECLAMATION WILL GRANT THE REQUESTED WAIVER.**

3. No occupancy of the surface or surface drilling will be allowed in the following areas. In addition to, no directional drilling will be allowed that would intersect the subsurface zones delineated by a vertical plane in these areas. The following restrictions apply only to mineral tracts located within the boundary of a Bureau of Reclamation project where the United States owns 100 percent of the fee mineral interest.

- a. Within 1,000 feet of the maximum water surface, as defined in the Standard Operating Procedures (SOP), of any reservoirs and related facilities located within the leased area.
- b. Within 2,000 feet of dam embankments and appurtenance structures such as spillway structures, outlet works, etc.
- c. Within one-half (1/2) mile horizontal from the centerline of any tunnel within the leased area.
- d. Providing that appropriate environmental compliance measures can be ensured, and providing further that Reclamation project works and other public interests can be protected, Reclamation may consider, on a case-by-case basis, waiving the requirements specified in Section 3 hereof. **HOWEVER, LESSEES ARE ADVISED THAT OBTAINING SUCH A WAIVER CAN BE A DIFFICULT, TIME CONSUMING, AND COSTLY PROCESS WITH NO GUARANTEE THAT RECLAMATION WILL GRANT THE REQUESTED WAIVER.**

4. The distances stated in items 2 and 3 above are intended to be general indicators only. The Bureau of Reclamation reserves the right to revise these distances as needed to protect Bureau of Reclamation facilities.

5. There will be no discharges into any Bureau of Reclamation water delivery or drainage facilities.

6. Lessee shall not use Bureau of Reclamation operation and maintenance roads for lease related access without prior written approval of the Bureau of Reclamation.

7. The use of explosives in any manner shall be so controlled that the works and facilities of the United States, its successors and assigns, will in no way be endangered or damaged. In this connection, an explosives use plan shall be submitted to and approved by the Resource Division Manager, Lahontan Basin Area Office, Bureau of Reclamation, or their authorized representative.

8. There is also reserved to the United States, the right of its officers, agents, employees, licensees and permittees, at all proper times and places freely to have ingress to, passage over, and egress from all of said lands for the purpose of exercising, and protecting the rights reserved herein.

9. The Lessor reserves the ownership of brines and condensates and the right to receive or take possession of all or any part thereof following the extraction or utilization by Lessee of the heat energy and byproducts other than demineralized water associated therewith subject to such rules and regulations as shall be prescribed by the Secretary of the Interior. If the Lessor elects to take the brines and condensates, the Lessee shall deliver all or any portion thereof to the Lessor at any point in the Lessee's geothermal gathering system after separation of the steam and brine products or from the disposal system as specified by the Lessor for the extraction of said brines and condensates by such means as the Lessor may provide and without cost to the Lessee.

There is no obligation on the part of the Lessor to exercise its reserved rights. The Lessor shall not be liable in any manner if those rights are not exercised, and, in that event, the Lessee shall dispose of the brines and condensates in accordance with applicable laws, rules and regulations. The Lessor reserves the right to conduct on the leased lands, testing and evaluation of geothermal resources which the Lessor determines are required for its desalinization research programs for utilization of geothermal fluids. These programs may include shallow temperature gradient hole underground exploration, if they are conducted in a manner compatible with lease operations and the production by Lessee of geothermal steam and associated geothermal resources.

Lessor reserves the right to erect, maintain, and operate any and all facilities, pipelines, transmission lines, access roads, and appurtenances necessary for desalinization on the leased premises. Any desalting plants, piping, wells, or other equipment installed by the Lessor on the leased premises shall remain the property of the Lessor; and the Lessee shall conduct his operations in a manner compatible with the operation and maintenance of any desalting plants, piping, wells, or other equipment installed by the Lessor. Any brines and condensates removed by the Lessor shall be replaced without cost to the Lessee with fluids as compatible with reservoir fluids as the brines or condensates that the Lessor removed and where the Lessor and Lessee determine that they are needed by the Lessee for his operation or for reinjection into the geothermal anomalies.

The Lessor and the Lessee, if authorized by law, may enter into cooperative agreements for joint development and production of geothermal resources from the leased premises consistent with applicable laws and regulations. Any geophysical, geological, geochemical, and reservoir hydraulic data collected by either the Bureau of Reclamation or the Lessee will be made available upon request to the other party, and the data furnished to Reclamation by the Lessee shall be considered confidential so long as the following conditions prevail:

a. Until the Lessee notifies Reclamation that there is no requirement to retain the submitted data in confidential status or until Lessee relinquishes all interest in the leased area from where the information was obtained.

b. Reclamation shall not incorporate data received from the Lessee in its publications or reports during the period that confidential data are being retained without written authorization from the Lessee.

c. Information obtained by Reclamation, and upon request submitted to the Lessee, shall not be used in publications or reports issued by Lessee without written consent of Reclamation until the data have been published or otherwise given distribution by Reclamation.

10. Bureau of Reclamation will review all road or bridge crossings, piping or closure of any reclamation project feature, and review NEPA and Cultural clearances on an individual basis.

11. The lessee shall be liable for all damage to the property of the United States, its successors and assigns, resulting from the exploration, development, or operation of the works contemplated by this lease, and shall further hold the United States, its successors and assigns, and its officers, agents, and employees, harmless from all claims of third parties for injury or damage sustained or in any way resulting from the exercise of the rights and privileges conferred by this lease.

12. The lessee shall be liable for all damage to crops or improvements of any entryman, nonmineral applicant, or patentee, their successors and assigns, caused by or resulting from the drilling or other operations of the lessee, including reimbursement of any entryman or patentee, their successors and assigns, for all construction, operation,

and maintenance charges becoming due on any portion of their said lands damaged as a result of the drilling or other operations of the lessee.

13. In addition to any other bond required under the provisions of this lease, the lessee shall provide such bond as the United States may at any time require for damages which may arise under the liability provisions of sections eleven (11) and twelve (12) above.

Description of Lands

PARCEL NV-08-08-002

ALL LANDS

**LEASE STIPULATIONS
BUREAU OF RECLAMATION**

The Lessee agrees to maintain, if required by the lessor during the period of this lease, including any extension thereof, an additional bond with qualified sureties in such sum as the lessor, if it considers that the bond required under Section 2(a) is insufficient, may at any time require:

(a) to pay for damages sustained by any reclamation homestead entryman to his crops or improvements caused by drilling or other operations of the lessee, such damages to include the reimbursement of the entryman by the lessee, when he uses or occupies the land of any homestead entryman, for all construction and operation and maintenance charges becoming due during such use or occupation upon any portion of the land so used and occupied;

(b) to pay any damage caused to any reclamation project or water supply thereof by the lessee's failure to comply fully with the requirements of this lease; and

(c) to recompense any non-mineral applicant, entryman purchaser under the Act of May 16, 1930 (46 Stat. 367), or patentee for all damages to crops or to tangible improvements caused by drilling or other prospecting operations, where any of the lands covered by this lease are embraced in any nonmineral application, entry, or patent under rights initiated prior to the date of this lease, with a reservation of the oil deposits, to the United States pursuant to the Act of July 17, 1914 (38 Stat. 509).

As to any lands covered by this lease within the area of any Government reclamation project, or in proximity thereto, the lessee shall take such precautions as required by the Secretary to prevent any injury to the lands susceptible to irrigation under such project or to the water supply thereof; *provided* that drilling is prohibited on any constructed works or right-of-way of the Bureau of Reclamation, and *provided, further*, that there is reserved to the lessor, its successors and assigns, the superior and prior right at all times to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures, and reclamation works, in which construction, operation, and maintenance, the lessor, its successors and assigns, shall have the right to use any or all of the lands herein described without making compensation therefore, and shall not be responsible for any damage from the presence of water thereon or on account of ordinary, extraordinary, unexpected, or unprecedented floods. That nothing shall be done under this lease to increase the cost of, or interfere in any manner with, the construction, operation, and maintenance of such works. It is agreed by the lessee that, if the construction of any or all of said dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone or telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures or reclamation works across, over, or upon said lands should be made more expensive by reason of the existence of the improvements and workings of the lessee thereon, said additional expense is to be estimated by the Secretary of the Interior, whose estimate is to be final and binding upon the parties hereto, and that within thirty (30) days after demand is made upon the lessee for payment of any such sums, the lessee will make payment thereof to the United States, or its successors, constructing such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures, or reclamation works, across, over, or upon said lands; *provided, however*, that subject to advance written approval by the United States the location and course of any improvements or works and appurtenances may be changed by the lessee; *provided further*, that the reservations, agreements, and conditions contained in the within lease shall be and remain applicable notwithstanding any change in the location or course of said improvements or works of lessee. The lessee further agrees, that the United States, its officers, agents, and employees, and its successors and assigns shall not be held liable for any damage to the improvements or workings of the lessee resulting from the construction, operation, and maintenance of any of the works herein above enumerated. Nothing in this paragraph shall be construed as in any manner limiting other reservations in favor of the United States contained in this lease.

THE LESSEE FURTHER AGREES That there is reserved to the lessor, its successors and assigns, the prior right to use any of the lands herein leased, to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures, and also the right to remove construction materials therefrom, without any payment made by the lessor or its successors for such right, with the agreement on the part of the lessee that if the construction of any or all of such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures across, over, or upon said lands or the removal of construction materials therefrom, should be made more expensive by reason of the existence of improvements or workings of the

ATTACHMENT 2

Environmental Protection Measures

VPC would implement emergency plans for:

- Injuries
- Well blowouts
- Fire
- Spill or discharge contingencies (for drilling mud, geothermal fluid, lubricants, fuels, etc.)
- Hazardous gas control
- Drilling safety and action plans

The purpose of these plans is to provide guidance to field personnel and management in the event of a field related emergency. The plans are intended to be comprehensive in that they describe the nature of various hazards or problems that might be encountered and specify appropriate preventive or anticipatory actions and equipment, as well as specific responses, notifications and follow up procedures that are required in the event of a field emergency. Emergencies such as accidents and injuries are covered, as are fire hazards management and risk assessment.

VPC would comply with all special lease stipulations attached to leases NVN-085705 (Appendix C of the EA). The project would comply with all local, state, and federal requirements. VPC would inform all personnel, as well as well drilling, testing, and supply contractors, of policies regarding protection and undue degradation of the environment. The Applicant Proposed Environmental Protection Measures are intended to minimize impacts from occurring as a result of project development and operations. Protection of the environment is also discussed in detail in Chapter 4, Environmental Consequences.

The specific environmental protection measures listed by activity or environmental resource area below are incorporated into the applicant's proposed action as integral components of the proposed project. Refer to Appendix D for written confirmation of these environmental commitments.

Water Resources

- The reserve pit would be lined to prevent seepage of testing fluids into the underlying groundwater.
- Containment berms would be constructed around all hazardous material or potentially hazardous material storage areas. Off-pad stormwater is directed away from the well pads.
- BOPE would be maintained at the wellhead to allow well shutdown if an uncontrolled flow of fluid or gas occurs.
- A cement and casing program for construction of any wells would be implemented to prevent water quality effects on groundwater during or after well installation. Borehole geophysics analyses (cement bond logs) would be conducted to document that wellcasing

grouting activities provide an effective seal, isolating the geothermal aquifer from shallow alluvial aquifers.

- No ground disturbance would be conducted within 650 feet of a canal or water feature on federal leased land prior to Reclamation's consent.
- VPC would obtain necessary permits for work in waters and/or groundwater discharge permits and would provide a Notice of Intent to NDEP prior to well pad construction.
- A hydrologic evaluation program will be implemented, which will be site specific and its intensity will be commensurate with the level of development drilling.

Wetlands/Riparian Zones

- Transmission lines would span wetlands to the extent feasible.
- Dips or culverts would be installed for access roads so as not to impact flows.
- Construction of the transmission line would occur in the dry season
- Existing two-track roads would be used to the greatest extent feasible
- BMPs to prevent release of fuels or other construction materials would be implemented, including VPC's SWPPP and Spill Prevention, Control, and Countermeasure (SPCC) Plan, which would be prepared and submitted to the BLM and Reclamation prior to construction.
- When permanent new access roads must cross ephemeral washes, rolling dips would be installed. The rolling dips would be designed to accommodate flows from at least a 25-year storm event. Culverts may be used wherever rolling dips are not feasible.

Floodplains

- Roads would be constructed with culverts properly sized to convey at least a 25-year storm event.
- Existing two-track would be used as access roads to the greatest extent feasible along the roads to minimize the amount of additional base material and construction necessary.

Vegetation

- Reclamation of well pads and access roads would occur when it is determined that they would no longer be used for exploration, utilization, or any other purposes. During operations, interim reclamation would be conducted for the well pad areas no longer needed for operation or maintenance. All reclamation would be performed in accordance with the Gold Book (2007).
- Reclamation would be performed in accordance with lease stipulations. Reclamation would include re-contouring of disturbed areas to blend in with the surrounding topography and use of appropriate methods to seed with a diverse perennial seed mix. The seed mix used to reclaim disturbed areas would be certified weed free. The seed mix would be developed by an experienced botanist in coordination with the BLM, Reclamation, and/or NDOW and would be based on seed availability and quality. Reseeding would not be undertaken in areas where soil conditions are inappropriate or where the adjacent undisturbed land surface has little or no vegetation, as determined in coordination with a qualified biologist. Native soil material and organic matter (topsoil) salvaged from the site preparation operations would be reused as a topdressing on berms and other areas requiring revegetation to the extent practical.

- A qualified botanist would perform vegetation surveys in the blooming period prior to construction of the transmission line and access roads in T20N R25E, Section 10 for Nevada dune beardtongue (*Penstemon arenarius*) and Lahontan indigo bush (*Psoralea kingii*). If any individuals of these two plants are found they would be avoided or a replanting and restoration plan would be prepared and implemented.

Invasive and Non-native Species

- The potential to increase the spread of invasive, non-native species would be minimized through the implementation of the Noxious Weed Abatement Plan, included in Appendix E to this EA for project construction, operation, and decommissioning.

Wildlife

- Vehicles would not travel off designated access roads or out of approved right-of-ways or easements.
- Willows or roosting habitat would be avoided to the greatest extent feasible. If willows have to be removed, the vegetation would be inspected by a qualified biologist for bats and Nevada viceroy (*Limenitis archippus*) just prior to removal. If a bat or viceroy is found, the habitat would not be removed until the bat or butterfly has left the area.

Migratory Birds

- The transmission line would be designed to minimize effects to migratory birds and waterfowl within the FWMA, including incorporation of appropriate spacing between lines to make it improbable that the wing span of a large migratory bird can connect two phases.
- Anti-perch spikes would be installed on the top of cross-arms.
- Anti-collision devices approved by NDOW would be used on the shield wires and phase conductors along the transmission line segments that are oriented north/northwest at the west end of the line, within the boundaries of the FWMA.
- Habitat for migratory birds would be eliminated within areas of proposed disturbance prior to the nesting season. In the event this elimination measure is not implemented, if ground disturbing activities do take place during the migratory bird nesting season, migratory bird nest surveys would be conducted early in the nesting season by a qualified biologist acceptable to BLM/Reclamation and/or NDOW. The survey would be conducted to identify either breeding adult birds or nest sites within the specific areas to be disturbed. If active nests are present within these areas to be disturbed, VPC would coordinate with BLM/Reclamation and/or NDOW to develop appropriate protection measures for these sites, which may include avoidance, construction constraints, and/or the establishment of buffers.
- To minimize impacts to migratory birds and other wildlife through habitat alteration well pads and roads would be recontoured and reseeded following completion of construction. Reseeding would not be undertaken in areas where soil conditions are inappropriate or where the adjacent undisturbed land surface has little or no vegetation, as determined in coordination with a qualified biologist.
- Topsoil would be salvaged and reused whenever possible and in a timely manner.

- During drilling, if the reserve pit contains oil-based contaminants (such as from runoff or drilling muds) the pits would be fitted with exclusion devices such as netting or floating balls, in accordance with lease stipulations.

Cultural Resources

- If any construction or operations activities require disturbance beyond the existing survey boundaries, additional surveys would be completed and any resources found would be avoided or properly mitigated.
- A thirty meter buffer would be placed around historic properties identified and an archaeological monitor would be on site during the construction of any areas within the 30 meter buffer.
- If subsurface cultural resources are found during construction, all work in the vicinity of the resource would cease and the BLM, Reclamation, and/or NDOW environmental personnel would be notified immediately. The appropriate measures as requested by the BLM, Reclamation, NDOW, and/or SHPO to protect the resource would be implemented until it could be adequately evaluated by the permitted archaeologist, and the BLM, Reclamation, and/or NDOW archaeologist, if necessary.

Native American Religious Concerns

- If human remains are identified during construction of any of the components of the proposed project, work within 300 feet of the discovery would be stopped and the remains would be protected from further exposure or damage. The coroner and Reclamation, NDOW, or SHPO (depending on land ownership) would be contacted. If the remains are determined to be Native American, the agencies would follow the procedures set forth in 43 CFR Part 10, Native American Graves Protection and Repatriation Regulations. Procedures for handling the discovery of human remains would follow Reclamation Manual Directives and Standards LND 07-01 (Inadvertent Discovery of Human Remains on Reclamation Lands) if remains are located on Reclamation-managed lands. If remains are found on private land, NRS 383 would be implemented with SHPO as the lead agency.

Minerals Resources

- Fill materials would be obtained from the permitted mine located east of Black Butte, in Section 24, T20N, R26E (assigned serial number N-86320) or purchased from commercial sources.

Soils

- Any suitable topsoil will be stockpiled onsite for later use during restoration. Access roads would follow existing routes to the extent possible. In areas where new access roads must be constructed across slopes, erosion control measures would be installed as necessary, in accordance with Gold Book standards (BLM 2007a).
- Erosion control measures, including but not limited to silt fencing, diversion ditches, water bars, temporary mulching and seeding, and application of gravel or rip rap, would be installed where necessary immediately after completion of construction activities to avoid erosion and runoff. Only certified weed-free BMPs would be used.
- Additional gravel would be laid down when ground conditions are wet enough to cause rutting or other noticeable surface deformation and severe compaction.

- The NDEP Bureau of Air Pollution Control SAD permit documenting the BMPs to be used would be implemented for the project because the surface disturbed would be greater than 5 acres.
- Vehicle travel on unpaved roads would be limited to 30 mph.
- Existing two-track access roads would be used along the transmission route to minimize the amount of new surface disturbance and potential for erosion during construction of the transmission line.
- Any topsoil stockpiles will be located on previously disturbed areas, such as portions of well pads, and will be situated so that wind and water erosion of the piles are minimized and the reclamation potential of the soil is maintained. Other erosion control measures may include surface seeding and moisture conditioning.

Wastes, Hazardous or Solid

- Containment berms would be constructed around all hazardous material or potentially hazardous material storage. Off-pad stormwater would be directed away from the well pads.
- An emergency response plan would be implemented that includes contingencies for hazardous materials spills and disposals.
- VPC would adhere to general geothermal lease stipulations for geothermal developers to address the potential impacts involved with transport, use, and disposal of hazardous materials, including the development and implementation of an emergency response plan.
- VPC would comply with all local, state, and federal regulations regarding the use, transport, storage, and disposal of hazardous materials and wastes. Wastes considered hazardous by the State of Nevada would be transported and disposed of according to applicable federal, state, and local regulations.
- VPC would prepare and implement a hazardous material spill prevention plan to minimize impacts to the environment from hazardous materials.
- Fueling and routine maintenance of equipment and vehicles would be performed off site or within designated areas with appropriate spill controls to minimize effects.
- Drilling mud and fluid would be directed to reserve pits. At the conclusion of drilling and testing, the liquid portions of the containment basin contents would be evaporated, pumped back down the well, or removed and disposed of off-site in a facility authorized to receive such wastes. The remaining contents, typically consisting of nontoxic drilling mud and cuttings, would be tested as required by the Nevada Bureau of Water Quality Planning (BWQP). If non-toxic and as authorized by the BWQP, these materials would be spread and dried on the well site, mixed with soil and buried in the on-site reserve pit in conformance with the applicable requirements of the BWQP, Reclamation, and the BLM. Testing results and location of buried waste would be provided to Reclamation and BLM.
- A blow-out prevention plan and BOPE would be implemented.
- Operation of the geothermal facilities would comply with all local, state, and federal regulations regarding the use, transport, storage, and disposal of hazardous materials and wastes and therefore minimize impacts to the environment.

Air Quality

- The SAD Air Quality Operating Permit (AP1629-2517), obtained for the project, stipulates that a plan for fugitive dust control must be implemented. The fugitive dust control plan would include dust suppression processes (e.g., watering access roads and well pads) to minimize localized increases in particulate matter concentrations.
- Dust emissions from venting steam would be reduced by injecting water into the blowie line.
- Vehicle speeds would be minimized on exposed soils to 10 to 30 miles per hour (mph) to reduce fugitive dust generation from vehicle travel.
- Diesel generators over 37 kW (50 horse power) shall be diesel-fired units that are certified to meet the US Environmental Protection Agency's (EPA) Tier II Emission Standards and are equipped with an exhaust particulate filter system.
- H₂S emissions would be minimized through the use of properly weighted drilling mud which is expected to keep the well from flowing during drilling. Data collection devices would be installed and operated during all phases of drilling and testing. An H₂S abatement plan would be developed and implemented during long-term flow-testing if it becomes apparent during drilling operations that H₂S abatement is necessary to minimize potential nuisance odors. Measures to reduce H₂S, if necessary, could include but are not limited to:
 - ✓ Reducing the number of wells venting simultaneously, as applicable
 - ✓ Implementing additional wellhead abatement measures, such as caustic injection between the flash tank and the portable silencer
 - ✓ All drill rigs would be equipped with alarms to detect unsafe levels of NCGs.